

Patent Claims

1. An installation arrangement for an air-conditioning system with a heating apparatus, in particular for motor vehicles, having
5 at least one housing in which air is fed in an at least partially predefined flow path, and
10 which has at least one heating apparatus and at least one actuating device, with the heating apparatus being arranged in a first flow path and the actuating device being arranged at least partially in a second flow path,
15 characterized in that
in at least one position the actuating device virtually completely brings about the flow through
20 the heating apparatus.
2. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in claim 1, characterized in that
25 the housing has at least one inlet and at least one outlet for the air.
3. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in at least one of the preceding claims,
30 characterized in that
35 the heating apparatus is selected from a group of heating apparatuses which contains heat exchangers, CO₂ heat pumps, heaters which use exhaust gas heat, fuel heater, condensers, stationary-mode heaters, electric heaters, PTC heaters and the like.

4. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in at least one of the preceding claims, 5 characterized in that

the heating apparatus has a core which conducts heat and whose heat exchanger surface is formed by baffle plates which are arranged at a predefined 10 angle to the main direction of extent of the core, in a heat-conducting fashion on its surface.

5. The installation arrangement for an air-conditioning system with a heating apparatus as 15 claimed in claim 4, characterized in that

at least part of the surface of the heat-conducting core has a flow of air around it.

20 6. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in claim 5, characterized in that

25 the cross section of the heat-conducting core is such that the flow of the air at least along part of the surface of the heat-conducting core is essentially laminar.

30 7. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in one of claims 4 to 6, characterized in that

35 the cross sectional shape of the heat-conducting core is asymmetrical.

8. The installation arrangement for an air-conditioning system with a heating apparatus as

claimed in one of claims 4 to 7, characterized in that

5 a free cross section through which some of the air which flows through the heating apparatus flows is formed between the heat-conducting core and an element which adjoins the heating apparatus and at least partially bounds the first flow path.

9. The installation arrangement for an air-
10 conditioning system with a heating apparatus as claimed in one of claims 4 to 8, characterized in that

15 a third flow path through which a heating medium flows is arranged within the heat-conducting core.

10. The installation arrangement for an air-
conditioning system with a heating apparatus as claimed in claim 9, characterized in that

20 the heating medium is a fluid, preferably a gas, and is particularly preferably an exhaust gas of a combustion process.

25 11. The installation arrangement for an air-
conditioning system with a heating apparatus as claimed in claim 9 or 10, characterized in that

30 the heating medium which flows through the heat-conducting core brings about a temperature gradient across the cross section of the core.

12. The installation arrangement for an air-
conditioning system with a heating apparatus as claimed in one of claims 4 to 11, characterized in that

35 a temperature gradient of the heat-conducting core is at least partially parallel with a temperature

gradient of the air which flows through the heating apparatus.

13. The installation arrangement for an air-
5 conditioning system with a heating apparatus as claimed in at least one of the preceding claims, characterized in that

10 the buffer plates of the heat exchanger surface have a basic shape which is selected from a group of shapes which contains squares, rectangles, circles, ellipses, polygons, combinations of the latter and the like.

15 14. The installation arrangement for an air-
conditioning system with a heating apparatus as claimed in at least one of the preceding claims, characterized in that

20 the heating apparatus is arranged in a bypass duct.

15. The installation arrangement for an air-
25 conditioning system with a heating apparatus as claimed in at least one of the preceding claims, characterized in that

30 the heating apparatus is arranged at a predefined distance from the external wall of the housing.

16. The installation arrangement for an air-
conditioning system with a heating apparatus as claimed in at least one of the preceding claims, characterized in that

35 the heat exchanger surface of the heating apparatus assumes a predefined angle to the longitudinal axis of the motor vehicle.

17. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in at least one of the preceding claims, 5 characterized in that

at least one fan, in particular an electric fan, which promotes the movement of air through the device within at least one flow path is provided in the housing.

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18. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in at least one of the preceding claims, characterized in that

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the air is fed directly and/or indirectly into the passenger compartment of a motor vehicle through the outlet.

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19. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in at least one of the preceding claims, characterized in that

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the actuating device can be moved into at least two positions.

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20. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in at least one of the preceding claims, characterized in that

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the actuating device is infinitely adjustable, with the proportion of air which is fed through the heating apparatus and/or past the heating apparatus being changed and in particular closed-loop and/or open-loop controlled depending on the position.

21. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in at least one of the preceding claims, characterized in that

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a second actuating device which essentially prevents a flow of air counter to the main direction of flow of the first flow path is arranged downstream of the heating apparatus in the first flow path.

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22. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in claim 21, characterized in that

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the second actuating device is embodied in such a way that it is at least partially opened by the air flowing through the heating apparatus in the main direction of flow.

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23. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in claim 21 or 22, characterized in that

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the second actuating device has a actuating element which at least partially counteracts an opening movement of the actuating device.

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24. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in at least one of the preceding claims, characterized in that

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the actuating devices are selected from a group of actuating devices which contains flaps, swinging flaps, segmented flaps, wing flaps, shutters, in particular iris shutters and the like.

25. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in at least one of the preceding claims, characterized in that

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a device for filtering air, in particular in the region of the inlet is provided.

10 26. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in at least one of the preceding claims, characterized in that

15 an closed-loop or open-loop control device which performs closed-loop or open-loop control on, in particular, the quantity of air flowing through is provided on the at least one inlet and/or outlet for the air.

20 27. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in at least one of the preceding claims, characterized in that

25 the air is fed at least partially along a dividing wall adjoining an internal combustion engine, and in that at least one heating apparatus is arranged in particular in this region.

30 28. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in at least one of the preceding claims, characterized in that

35 the device has at least one sensor which is selected from a group of sensors which determine the temperature, pressure, speed such as, for example, the flow rate of a medium, or the position of a component.

29. The installation arrangement for an air-conditioning system with a heating apparatus as claimed in at least one of the preceding claims,
5 characterized in that

the individual elements and/or assemblies of the device are arranged basically one behind the other in the flow path, in which case in particular at least one element and/or one assembly can be
10 removed from the main flow path of the air by means of a bypass.